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careous shells of Foraminifera, the beautifully sculptured frustules of Diatomaceæ, keen siliceous needles, and the sharp armatures of minute crustacea.

In the fore-part of the intestinal canal, the food mass, staining almost as readily as the wall of the gut itself, seems to merge into the ill-defined epithelium of the latter, and it is scarcely possible to say where the food-bearing mucous thread ceases and the intestinal epithelium begins, especially as this latter has a rugous arrangement. That we have here to do with a form of digestion entirely anomalous and unprecedented, he could not believe, and must beg leave to differ from Dr. Korotneff on this point. Fol and others have recognized the endostyle as a sort of salivary gland, and have traced its food-laden mucous thread into the stomach of the living animal, while the speaker had been able to trace the same thing in well-preserved specimens. He had also several series of sections from animals which must have been without food for some time previous to death, in which the lumen of the intestine is not only free of food, but of any obliterating mass of cells, or plasmodium. The only protoplasmic bodies not food, are certain Gregarina-like organisms adhering to the walls of various parts of the intestine, and which he took to be parasites. These give on section the appearance of the large "scattered cells, entirely free from their surroundings" which Korotneff figures and regards as "analogous to the great stomach-cell of *Anchinia.*" The first opportunity would be taken to examine these structures in living Salpæ, but he was now forced to conclude that Dr. Korotneff has endowed the food-bearing mucous thread with a power it does not possess, that *Salpa* does not exhibit any unusual form of intracellular digestion, and that there is no immediate cause on its account for questioning the high genetic place occupied by the Tunicates.

A Preliminary Note on a Reaction common to Peptone and Bile-salts.—Dr. N. A. Randolph stated that if the acid nitrate of mercury (Millon's reagent) be added to a cold aqueous solution of potassium iodide, a *red* precipitate of mercuric iodide always appears. When, however, either peptones or the biliary salts are present in noteworthy amount, the precipitate of nascent mercuric iodide assumes the *yellow* phase. As practically applied, the red may vary from salmon to scarlet, the yellow from pale lemon to orange.

In order to render the test sensitive to the presence of minute quantities of the substances in question, he had found it necessary to limit the amount of potassium iodide employed. Thus to each five cubic centimetres of the suspected fluid—which must be cold and either neutral or faintly acid—are added two drops of a saturated solution of potassium iodide, the two liquids being well mixed. Four or five drops of Millon's reagent are now added, the contents of the vessel thoroughly stirred or shaken. Under these circumstances the presence of peptone in amounts of less than one part in five thousand is readily shown. By the exercise of great care in the performance of this test he had been enabled to demonstrate the presence of peptone in a solution containing but one part of that body in seventeen thousand parts of water.

The conditions interfering with this reaction are: alkalinity of the fluid examined (readily overcome by neutralization); heat, which has the same influence upon the nascent mercuric iodide as have peptone and the bile-salts; and the presence of certain compounds, as potassium ferrocyanide, which chemically prevent the production of the mercuric iodide.

The reaction just described presents certain advantage from the fact that it is uninfluenced by the bodies usually found in the various organic fluids. It is efficient in the presence of a twenty per cent. solution of serum; the presence of considerable amounts of coagulated albumen and of acid-albumen does not interfere with the test. The following bodies in moderate amount do not affect the reaction: Saliva, Syntonin, Amygdalin, Para-Albumen, Diastase, Kreatin, Leucin, Pyrosin, Mucic Acid, Glucose, Urea, Uric Acid, Nitric, Hydrochloric, Sulphuric and Picric Acids, Glycerine, Alcohol, Atropia Sulphate, Pilocarpin Nitrate, Caffeine, Sodium Carbonate, Ammonium Oxalate, Sodium Phosphate, and Manganese Chloride and Ferric Chloride.

It is obvious that this reaction is useless to the student as an isolated test, inasmuch as it responds to two entirely distinct compounds, but its simplicity and striking colorations give it very considerable value when employed in corroboration of other tests.

Botanical Notes.—At the meeting of the Botanical Section on April 14, Mr. THOMAS MEEHAN made some observations on the following topics:—

Evolution of Heat in Plants.—Referring to some observations of Kerner respecting the thawing out of chambers in ice by living plants in the Alps of Europe, he confirmed them by observations on *Eranthis hyemalis* made during the past winter. At the end of January the plant was in flower after a few warm days, when a driving snow-storm prostrated the little stems, and covered them nearly a foot deep, in which condition they remained till early in March. After they had been three weeks in this condition, the snow was carefully removed, when it was found that the stems had become perfectly erect, and a little chamber in the snow had been thawed out about each flower-stem. There was, however, no other evidence of growth. The few buds which were unopened when the snow came, were still unopened when the snow thawed away, after five weeks' imprisonment; and the idea conveyed was that plants would retain life, without growth, for an indefinite time, when under a low temperature, such as a covering of ice or snow afforded.

Relation of Heat to the Sexes of Flowers.—He referred to his former communications to the Academy regarding his discovery that the male flowers or male organs of flowers entered on active growth at a much lower temperature than excited the female, and exhibited catkins and female flowers of the European hazel-nut, *Corylus Avellana*, just matured April 15, and which, for the first time in several years past, had perfected themselves cotemporaneously. This was the first winter for some time that there had been a uniform low temperature the whole season. In other years a few warm days in winter would advance the male flowers so that they would mature weeks before the female flowers opened, hence the females were generally unfertilized, and there were few or no nuts. Under this law it was evident amentaceous plants could not abound to any great extent in countries or in localities favorable to bringing forward the male flowers before there was steady warmth enough to advance the female. He thought this was likely to be the reason why so many coniferous trees under culture in the vicinity of Philadelphia bore scarcely any fertile seed in their cones—a fact which had often been remarked in connection especially with the Norway spruce. The male flowers would mature before the female had advanced far enough to be receptive of the pollen,

Specific Differences in Picea nigra.—It was regarded as somewhat difficult to distinguish between the red and black spruces. Mr. Meehan exhibited authentic specimens of these and the white spruce, and pointed out the persistent character of the cones in *Picea nigra*, to which his attention had been called by Mr. Robt. Douglas, of Waukegan, Illinois. They were still attached to the branches exhibited.

The Flowers of Platanus.—Having an opportunity to examine a large tree of *Platanus occidentalis*, no exception could be found to the rule that the pedicel proceeded from the third node in the season's growth. It appeared also that in the formation of the pedicel, the growth of the branch was always almost arrested—but not sufficiently so but that it seemed to recover and make a second growth. In many cases the annual growth was completely suppressed, and only a terminal bud was formed just above the axis of the pedicel; but in most cases, another or secondary growth followed the first temporary check and a shoot of several nodes would be formed beyond the point of departure of the pedicel. The same rule prevailed in *Platanus orientalis.*

Variation in Symplocos fœtidus.—Mr. Meehan had made it a point for some years to take, as opportunity offered, some genus of only a single species within a large range of territory, and note the variation therein. In this way we could often see a vast amount of variation, which could not be started by any hybridization with other forms, but which must have been produced by some law of evolution within itself. Even though one might believe himself to be quite familiar with the skunk cabbage, *Symplocos fœtidus*, he would be surprised at the great amount of variation it presented, even in a small area, when the variations were looked for by comparison. He had himself seen a plant bearing spathes four inches long, with its next neighbor having one a little over an inch—no larger than a walnut. Some would be globular, some ovate, some linear, some terminating in an abrupt point, others lengthened into a long straight or curved beak. The variations in color were too well known to need more than this bare reference. It was not uncommon to hear variation attributed to environment, by which we are to understand external, and in a measure accidental circumstances. Environment might be led to include some external influence operating on the primary cell, giving birth to the subsequent individual exemplifying the variation.

But in this sense, change by environment would be the merest guess, as no evidence had been offered in support of any special influence then not exerted. At other times no great variation followed, and possibly no one would want to embrace this point in a definition of environment.

Sugar in Cladastris tinctoria.—In Mr. Meehan's garden at Germantown, there were few trees but which exuded sap from wounds made in winter or early spring, but among them all, few bled, as it was termed by horticulturists, more profusely than *Cladastris tinctoria* (*Virgilia lutea* Mx.). The icicles formed from this exuding sap afforded a good opportunity to test the saccharine character of the liquid. During congelation by frost all foreign substances are rejected, and in the formation of the icicle the sugar is pushed forward to the extreme point. The end of an icicle of a sugar maple is its only sweet part, and this was very sweet from the accumulation of the saccharine matter. The end of the icicle from the *Cladastris* was also sweet, though less so than in any other sugar-bearing trees he had observed.

April 22.

The President, Dr. Jos. Leidy, in the chair.

Twenty-eight persons present.

Vertebrate Fossils from Florida.—Prof. Leidy directed attention to some fossils, part of a collection recently referred to him for examination by the Smithsonian Institution. They consist of remains mostly of large terrestrial mammals, especially related with forms which now live in the intertropical portions of the old world. Obtained in Florida, they are of additional interest as evidences of the existence in this region of a formation of tertiary age not previously known. An accompanying letter from Dr. J. C. Neal, of Archer, Florida, informs us that the fossils